

COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

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COOP'S TECHNOLOGY DIGEST

April 1, 1998 ♦ VOLUME 98-03-46

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Doing Something About DTH Bankruptcy

Every digital DTH (satellite to home pay TV) programmer in the world is losing money. There are no exceptions to this statement. It is the cost of the 'IRD' (integrated receiver decoder) that is at the root of the problem.

CTD and sister publication SatFACTS have been tracking this situation since May 15, 1995. For those coming in late this synopsis:

Digital satellite delivery makes excellent economic sense to would-be programme service firms because:

1) A single satellite transponder, previously limited to a maximum of two analogue programme channels, can with digital transport 8 to 11 programme channels. Yes, there are not insignificant capital costs to transmit more than 2 digital programme channels on a single satellite transponder but these costs pale in significance against the high costs of transponder rental.

2) A built-in advantage of digital makes it possible for the programmer to "address" individual receivers on a programme channel by programme channel basis. This means the programmer has new marketing options, is capable of offering each channel a la carte (by itself), or in various common sense packages. Moreover, individual receivers (IRDs) can also be addressed on a channel by channel basis as a function of "time"; channel 7, for example, from 7 to 9PM on Wednesday April 8th. This allows the programmer to market and take orders for the delivery of "per event" programming.

Thus digital costs less to transmit because each programme channel occupies less satellite bandwidth, and, is more flexible than the best of the analogue systems. There are further advantages. Because as many as 11 programme channels (using state-of-the-art technology) can be transmitted through a single satellite transponder, it becomes economical to bicycle programming around the world. News and sport services originating in the UK now routinely appear on satellite (and cable) programme packages on the opposite side of the earth.

However, all is not well for digital DTH because there is one cost which seems given current technology to be a major obstacle. And that is the cost of placing the addressable, digital, receiver decoder into the consumer home.

The digital IRD is as much computer as satellite receiver. The basic IRD must have the ability to process in real time an MPEG-2 digital data stream, locate its own electronic address in the data stream and perform calculations when instructed by the authorisation "bits" within the data stream. In addition to these functions, the state-of-the-art IRD must also contain a telephone modem and special format IC chips that allow the IRD to "talk back" to the programming provider through a telephone connection. This last function makes possible on screen promotions for pay per view or pay per event which the IRD using consumer can respond to by selecting on screen ordering information. If you are an Internet user, or have observed Internet in operation, the on screen displays offering a special movie or event and the use of the computer mouse to select Internet options are identical in principle. The only

difference is an infrared remote control (IR) is substituted for the mouse.

A "basic" IRD with only the ability to tune in free to air (FTA) MPEG-2 digital broadcasts has now reached pricing levels in the region of US\$200 for quantities of 15,000 and up. This is the "cheap and dirty" version of MPEG-2 receiver and it has no usefulness for pay TV programmers.

A conditional access IRD, using Irdeto smart card technology, jumps to US\$300 (1) in the same 15,000 quantity range. The price increase from the bare bones FTA IRDs includes the additional hardware as well as an Irdeto license fee that attaches to any IRD with its system in-built (around US\$11 per receiver at OEM cost).

A conditional access IRD with modem and the chip capacity to allow the IRD to communicate with the service provider (through the modem) is more difficult to price as very few have been sold (in quantity) to date. A cost in the region of US\$350 per IRD in 15,000 quantities is believed accurate today.

The table (right) reflects a summary of what a DTH programmer will pay, in the best case, for each DTH installation for a consumer customer. It is in US dollars. This assumes no management oversight burden on the basic equipment selection, warehousing and distribution of the equipment into the field (shipping of dishes to remote sites can easily add US\$25 to each installation).

For the IRD + CA "package," with management and distribution overheads, the US\$425 will quickly become \$525 or more while the IRD + CA + modem package will end up in excess of US\$625. In first of April terms, Sky New Zealand faces a per installation cost in the region of NZ\$1093 while in Australia the cost is in excess of A\$990. With the slightest hiccup during installation, an extra \$100 or \$200 in local currency quickly piles on top of these "idealised" costs. This cost becomes a significant financial hurdle for the programmer who desperately wants to place as many IRDs as possible into operation but is reluctant to subsidise their deployment.

Maximum Discount Pricing at Programmer Cost for DTH System Packages

	FTA Only	CA with card system	CA and modem
FTA IRD	\$200		
CA IRD		\$300	
CA + Modem IRD			\$350
Antenna (0.6m region)	\$20	\$20	\$20
LNBF (1.2 dB nf region)	\$30	\$30	\$30
Mount (side of building)	\$11	\$11	\$11
Cable (2 GHz rated)	\$10	\$10	\$10
Installation parts	\$9	\$9	\$9
Telephone modem parts			\$21
Dish install labour	\$45	\$45	\$45
Telephone modem labour			\$11
TOTAL cost	\$325	\$425	\$507

Note: All pricing is in US dollars including installation labour (at March 25, 1998 exchange rate). Totals should not be confused with "marketplace" rates which are established by the programmer based upon local currency to the US dollar.

1/ US\$300 is the price Austar reportedly is "negotiating" with suppliers of Irdeto equipped IRDs. Of interest, Scientific Atlanta D9234 IRDs shipped from Canada to Australia attract a 22% duty fee of just over A\$100 each which suggests they are being invoiced in the region of A\$480 of this unit. However, as SA-Sydney is purchasing from SA-Canada, the price may be more for internal accounting than "real world" costing.

The IRD Subsidy Game

Because the programmer has upwards of \$1,000 in "local currency" invested in each DTH/TVRO receiver system, and is looking forward to earning money on this investment through monthly receipts from the DTH subscribers, a portion of the monthly revenue must be set aside for retirement of the DTH system "debt." There are two important questions here:

- 1) How much of the monthly revenue will be earmarked for DTH system retirement, and,
- 2) How much will the consumer pay for the DTH system (as a "down payment")?

Sub questions include:

3) Will the consumer actually own the DTH system after a period of time as a subscriber (i.e., is the portion of the DTH system paid for up front by the programmer considered a time or deferred payment scheme?), and,

4) When a residence requests two or more IRD units, how will the cost (at the programmer level) of the additional equipment be carried on the books and paid for by the consumer?

From the programmer's perspective, having the consumer pay the total cost of the DTH/TVRO installation is the most desirable option. From the consumer viewpoint, it is the least attractive. And in fact, where the total cost to the consumer has exceeded US\$400 at the time of installation, the take-up of DTH services have grown very slowly if at all. (2) Any cost to the programmer that exceeds the amount the consumer is willing to pay at the time of installation becomes a "subsidy" which the programmer must pay, at least temporarily.

The difference between the actual cost of the installation and the amount collected from the consumer is carried on the programmer's books. Whether he chooses to do this by maintaining ownership of the DTH hardware forever, or by setting it up as a time / deferred payment amount owed by the consumer is another question to be answered. (3)

This difference between cost and installation price paid becomes a "subsidy," an amount of money which the programmer must have available to fund its growth. There are no magic formulae here; each market has its own limits which are established by local standard of living, consumer disposable income, and competition for the entertainment dollar. Once again, the programmer would like the subsidy to be as small as possible and as the tables on page 5 indicate, the amount of subsidy per installation affects the programmer's available cash flow for many years into the future.

By not subsidising the DTH/TVRO receiving system, only those consumers willing and able to afford the \$1,000 and upwards systems become users of the service. In the opposite extreme, as the Galaxy/Australis system in Australia learned, when the consumer invests only \$19.95 (with the balanced being carried as a subsidy), the consumer has no "loyalty" to the service and is just as quick to have the service cancelled as they were to have it installed.

2/ A survey by IRD manufacturer Pace Micro Technology, involving 1,800 random households in the UK, found that 41% of consumers surveyed were willing to "consider a digital IRD system" provided the price did not exceed US\$300. The other 59%? 23% said they would consider such a purchase if the price was US\$200 or under, and 31% said they would not consider the purchase at any price. 5% had no view on the matter. The question was asked in the frame of "purchase price" and left room for the programmer/seller to get back more than the stated price (\$200, \$300) over time as a part of the monthly programming charge.

3/ Sky Network NZ in placing their initial 12,000 DTH analogue terminals at NZ\$650 each has elected to retain ownership of the complete TVRO package. This means the consumer has in reality paid \$54.17 per month for his Sky (one channel initially, two channels after August 1997) service since he has purchased nothing from Sky except for the service. Sky, meanwhile, is depreciating for future tax purposes the analogue receiver and analogue decoder on a rapid write off since this equipment will be taken back by Sky when the digital service begins, and replaced with the new digital IRD.

SIZE of Subsidy vs. LENGTH of Time to Payoff

Amount of Subsidy in US\$	At US\$5 per month	At US\$7.50 per month	At US\$10 per month	At US\$12.50 per month	At US\$15 per month
US\$500	100 months	67 months	50 months	42 months	33 months
US\$400	80	53	40	32	27
US\$300	60	40	30	24	20
US\$200	40	27	20	16	13
US\$100	20	13	10	8	7

Subsidy is given in US\$ for uniformity. The true subsidy must include not only the dollar **difference** between equipment cost (as installed) at the time of installation and the "down payment" received from the consumer, but also the **interest expense** for the subsidised amount over the period of the subsidy.

Conventional wisdom suggests the "down payment" be large enough to ensure the customer is not tempted to cancel on a whim (by cancelling, they would "lose" their down payment) but not so large as to seriously curtail consumer acceptance of the service. That number would seem, from experience in Africa, the Middle East, Europe and North America to be someplace between US\$150 and US\$300. Which tells us the subsidy amount carried by the programmer will range between US\$350 and US\$225 for each subscriber.

The table above shows how long is required, at subsidy offsets between US\$5 and US\$15 per month, taken out of subscription revenues, to pay off a subsidy. The table below shows how much money you have remaining, after subtracting subsidies that range from US\$5 to US\$15, out of monthly subscription charges that range from A/NZ\$75 down to \$45. Now, what does all of this say to us?

HOW Much Money Remains From Subscription Fee After Deducting Monthly Subsidy "Payment"

If DTH Monthly Fee is ...	Take out US\$5 subsidy, you have left ...	Take out US\$7.50 subsidy, left is ...	Take out US\$10 subsidy, you have left ...	Take out US\$12.50 subsidy, left is ...	Take out US\$15 subsidy, you have left ...
\$75 A or NZ	\$66.25 NZ \$66.75 A	\$61.87 NZ \$62.62 A	\$57.50 NZ \$58.50 A	\$53.12 NZ \$54.37 A	\$48.75 NZ \$50.25 A
\$70 A or NZ	\$61.25 NZ \$61.65 A	\$56.87 NZ \$57.62 A	\$52.50 NZ \$53.50 A	\$48.12 NZ \$49.37 A	\$43.75 NZ \$45.25 A
\$65 A or NZ	\$56.25 NZ \$56.75 A	\$51.87 NZ \$52.62 A	\$47.50 NZ \$48.50 A	\$43.12 NZ \$44.37 A	\$38.75 NZ \$40.25 A
\$60 A or NZ	\$51.25 NZ \$51.75 A	\$46.87 NZ \$47.62 A	\$42.50 NZ \$43.50 A	\$38.12 NZ \$39.37 A	\$33.25 NZ \$35.25 A
\$55 A or NZ	\$46.25 NZ \$46.75 A	\$41.87 NZ \$42.62 A	\$37.50 NZ \$38.50 A	\$33.12 NZ \$34.37 A	\$28.25 NZ \$30.25 A
\$50 A or NZ	\$41.25 NZ \$41.75 A	\$36.87 NZ \$37.62 A	\$32.50 NZ \$33.50 A	\$28.12 NZ \$29.37 A	\$23.25 NZ \$25.25 A
\$45 A or NZ	\$36.25 NZ \$36.75 A	\$31.87 NZ \$32.62 A	\$27.50 NZ \$28.50 A	\$23.12 NZ \$24.37 A	\$18.25 NZ \$20.25 A
\$40 A or NZ	\$31.25 NZ \$31.75 A	\$26.87 NZ \$27.62 A	\$22.50 NZ \$23.50 A	\$18.12 NZ \$19.37 A	\$13.25 NZ \$15.25 A

REAL World Numbers - What It Cost Sky to Operate First 6 Months 1997

	Spent on Programming	Spent on Subscriber Management	Spent on Interest	Total Spent	Dollars Remaining (*)
For Each Dollar Taken In	43.4%	28.4%	9.3%	81.1%	18.9%
For each \$55 monthly fee	\$23.87	\$15.62	\$5.12	\$44.61	\$10.39

*/ The \$10.39 per subscriber per month should not be taken as "profit" nor as "cash flow" as Sky has indebtedness (principal payments to make) equal to 1.47 times its **total** annual receipts (before expenses) and a "deficit in stockholder equity" of NZ\$73 million. (Figures from November 19, 1997 interim report.)

Funds to retire the indebtedness attached to each DTH/TVRO installation with a subsidy must come out of the monthly revenue flow. There is the principal (the offset between what the installation costs the programmer and what the consumer pays to have the installation made), and, the interest on that "subsidy" over whatever length of time is required to pay it back. Although some programmers may come into the DTH/TVRO world with a war chest from public sale of stock (4), most firms such as Galaxy/Australis have either private or commercial funding to pay for each DTH installation.

Using the most recent (November 1997) public release of corporate performance for Sky Network TV (above), we see Sky claims to have NZ\$10.39 remaining monthly from each existing subscriber after paying for programming, operations and interest. If we ignore their present (mostly terrestrial and all analogue) subscriber base, and concentrate on the new (expected) satellite DTH digital subscriber base, these numbers can lead us to a close approximation of where Sky is headed, financially, with their digital DTH quest.

1) If we assume the average DTH subscription revenue to be NZ\$55,

2) And if we assume the cost of programming, subscriber management (i.e., all operations), and interest remains constant to November 1997 released figures, we have the same NZ\$10.39 per subscriber remaining per month.

But we still have the subsidy to retire.

If we take US\$5/NZ\$8.75 of that remaining money and use it to retire the subsidy, and we calculate the subsidy offset to be US\$300, the table on page 5 reveals it will take 60 months of dedicating that US\$5 each month to retire the subsidy and pay off that one particular DTH installation. If Sky elects to utilise the funds it realised from the sale of corporate stock late in 1997 for the subsidy costs incurred at the time of installation, the stock sale funds are essentially interest free (overlooking that they are being spent and can no longer sit in a bank attracting interest in their own right).

Moreover, if Sky elects to stage its digital TV rollout to an internal goal of converting every existing analogue subscriber to digital over a 60 month period, here is what happens:

1) If it takes 60 months for each subsidised installation to be "paid back" through a US\$5 per month "charge,"

4/ Sky Network NZ, counter to the trend in pay television ventures, raised approximately NZ\$100 million in a partial sale of corporate stock during the closing weeks of 1997. Thus they have in house funds with which to "subsidise" the individual DTH installations as well as pay for increased operating costs attached to leasing three full-time transponders from Optus for distribution of their service. If we assume a subsidy cost of US\$300 (NZ\$525) per DTH customer installation, and a "war chest" of NZ\$75 million, Sky has money available to subsidise 142,857 DTH subscribers with digital installations. They claim a present universe of approximately 290,000 analogue customers and nearly 50% of these analogue customers could be converted to digital and subsidised at NZ\$525 subsidy per installation using available (interest free) funds.

2) And Sky has an existing analogue subscriber base of 290,000, over a 5 year/60 month transition to digital Sky will at any point have between 4,833 and 290,000 "subsidy accounts" on the books in varying stages of pay off. In fact, the last analogue subscribers to convert to digital (those who wait until the 60th month to do so) will still be on the books with "subsidy accounts" 120 months out (10 years).

3) The peak subsidy account demand on financial reserves will occur in the region of the 30th to 60 months. Why is that? If Sky transitions 1/60th of its existing analogue base to digital each month, at the end of 30 months it will have 144,999 subsidy accounts operating. 1/30th of those will have been 50% retired (the first month group will have paid back 50% of the subsidy by the 30th month) and in month by month steps progressively less of the subsidy will have been paid back. Those who began subsidised service in month 29, for example, will have paid back only 1/60th of the subsidy in month 30. At that point, Sky will have around NZ\$22 million invested in subsidy "accounts". By the 60th month, Sky will have approximately NZ\$43.5 million in "subsidy accounts."

Over a 60 month period, as Sky attracts new subscribers and markets the existing subscribers to "upgrade" from analogue to digital, there are not insignificant demands on the corporate cash flow from the subsidy programme. This all but eliminates the possibility of meaningful dividends for that period of time.

There is another approach, one which helped launched the hugely successful BSkyB DTH platform in the UK.

Shifting the IRD Burden to the Consumer

A consumer who becomes a DTH subscriber by paying a down payment at the time of installation and agrees to a monthly subscription package will over time (60 months in our example) end up paying the complete cost of the DTH installation. There are arguments to suggest the consumer be actually allowed to own the equipment at the end of the subsidy pay out period, not the least of which notes that with the rapid development of IRD and compression technology, an IRD sold new in 1998 will be operationally outdated 60 months hence. If the programmer retains ownership of the equipment, but is faced with a wholesale change out of the IRDs by the 60 month point, a new subsidy period begins. Each time the improvement in technology dictates a business need to change out of the IRD, the programmer is faced with new financial challenges to create yet another subsidy period.

The subsidy approach is necessary because the consumer views the high cost of the IRD/DTH system as undesirable. "*What can I receive other than* (name of programme service provider)?" When they learn the answer is "*Actually, nothing - this is only for* (name of service provider)" interest in spending upwards of US\$500 disappears.

Britain's BSkyB began with the premise that they could be profitable by leaving all programme services (4 initially) free to air (FTA) and selling advertising. Over time the original 4 services became today's 20-plus services, with a mixture of conditional access (sold by subscription) and FTA programming. What this did was very simply this:

Consumers were never subsidised for their DTH packages, the retail cost of a home DTH system was driven solely by marketplace competition. As market competition drove the price of a complete (analogue) system under US\$300, home dish sales grew dramatically to more than 4.5 million in the UK alone.

By giving consumers some level of free to air programming, an incentive for the consumer to purchase the DTH system was created. And by allowing the marketplace to compete for best quality DTH system and lowest price, the original cost of a home system went down within three years by more than 75%. This has shifted the burden of attracting customers back to the marketplace removing any need for a subsidy programme at BSkyB.

This year BSkyB is adding a parallel digital service. The present 20-plus service channels will grow to as many as 200, and consumers with existing analogue systems will be asked to convert their systems to digital. In this situation, the primary cost of the change will be the receiver (IRD); a new digital IRD to replace the pre-existing analogue receiver (and decoder if the viewer also subscribes to conditional access BSkyB programming). The challenge here is to motivate the consumer to spend approximately US\$350 for a new piece of equipment which adds to the programme selection and

possibly allows viewing in various higher definition (wide screen) formats. BSkyB has not announced precisely how this will work, but indications are they will "expect" the consumer to pay around \$300 US for the equipment and they will "subsidise" whatever balance there might be. In this case, the subsidy is not likely to exceed US\$100 which means the "subsidy retirement period" becomes much shorter and more manageable for BSkyB.

A similar concept is in advanced planning at Australia's Optus. Here, Optus has created a pair of separate digital "platforms" and the master plan is to encourage consumers to purchase their own DTH/TVRO systems by offering free to air programming within the "Aurora" platform. Aurora simply means MPEG-2 transmission parameters following the world digital standard. Not all Aurora programme channels will be free to air, but many will be and that is the "hook" Optus hopes will encourage viewers to purchase their DTH systems without a subsidy.

BSkyB also plans to offer access to some number of FTA programme channels, convinced that these channels help consumers make a purchase decision for the DTH reception package. What other CA-only digital programme packagers have discovered in Africa, Asia and Europe is the consumers willing to spend even a reduced amount for a DTH system (reduced by a programmer subsidy) is far smaller than they had previously projected. In North America, complete home DTH systems (including antenna, and all parts) now routinely retail at and below US\$200 with programmers picking up the balance of the "true cost" with one form of subsidy or another. The US market is considered to be an anomaly in the world, perhaps because of the preconditioning of the marketplace by the ready availability of cable TV and C-band TVRO service.

The Optus plan will test for the first time in the South Pacific the BSkyB format of mixing some number of free to air services with various conditional access, subscription based, services. A similar study has been underway at Sky NZ. The decision becomes, which programme channels are FTA and which are only available by subscription?

1) The first candidate for FTA service would be terrestrial commercial services, such as 7, 9 and 10 in Australia and TV 1, 2, 3 and 4 in New Zealand. In these examples, there are commercial benefits to the terrestrial broadcasters to be on satellite (as a lower cost way to feed relay stations outside of the major centres, for example) and numbers in the region of A/NZ\$40,000 per month (\$500,000 per year) are being mentioned as possible charges by the satellite carrier to the terrestrial service.

2) In the case of New Zealand, a second candidate would be a national Maori service channel which to date has not been able to get underway using terrestrial services. The problem here is that annual family income for Maori in rural areas is significantly below the national average, making the purchase of a home dish system to receive the Maori broadcasts less likely except on a Marae (community) basis. Again, the service provider wants to be paid for this "transponder space" and this means that somehow in the government funding of Maori broadcast operations the annual cost of around NZ\$500,000 would have to be found to compensate Sky.

3) A news channel is another likely candidate and a Sky News Australia package is already operating 24 hours per day through Optus and other cable and DTH satellite packages.

4) A horse racing channel is yet another candidate and with the acquisition of Australia's Sky Horse Racing by the NSW TAB, this seems more and more likely to be distributed at least in Australia in a FTA format, perhaps by Optus in their DTH project. In New Zealand, TAB is an equivalent candidate although certainly Sky would expect payment for the transponder space.

5) A Christian or family channel is another candidate for FTA distribution. There is presently no such service operating in Australia although in New Zealand there are two Christian packages functional.

The goal here is to make the "FTA mix" attractive enough to consumers to shift the burden from the satellite DTH programmer to the consumer for the purchase cost of the equipment. It would be an ideal situation if all consumers purchased their DTH/TVRO systems at their own expense, eliminating any need for a "subsidy" on the part of the programmer. But there are hidden traps with this approach.

First of all, the MPEG data stream transmitted by the programmer must be compatible with two or more separate IRD source designs to create competition in the marketplace for the best quality at the lowest price. The Optus approach is to insist that the data stream remain non-proprietary and as we

May/September 1998	January 1999	July 1999
1 TR 8 to 11 chs	2 Tr 16 to 22 chs	3 Tr 24 to 40 chs (*)

Sky NZ migration to digital - subject to equipment availability. A single transponder (actually available to Sky May 1998 but IRDs not expected prior to September) at first with between 8 and 11 programme channels, followed 90-120 days later by conversion of existing analogue transponder to digital (January 1999 subject to actual start date of first digital transponder); at that point, 16 to 22 programming channels. Then in June 1999 Optus third transponder to be available allowing growth to 24 upwards to 40 programme channels. (*) NVOD (movies on near demand) pay per view channels can be compressed more severely than live TV offering the technical opportunity to shoehorn in more pay per view movie channels than would otherwise be acceptable for normal TV.

reported in CTD 9802 (p. 8), Optus has four separate IRD suppliers all planning to enter the Australian marketplace. Optus knows that it can, through its control of the proprietary Irdeto CA (conditional access) portion of the service, determine which programming goes to each IRD (consumer). It is not concerned that by transmitting all programming in a mixture of FTA and CA it will in any way compromise its subscriber management system. A selection of an IRD supplier (or possibly suppliers) for Sky NZ has not been announced and there are no present hints that more than one supplier will be selected.

The second problem is transponder loading versus which services are placed within the digital bouquets. Galaxy/Australis presently loads 11 programme channels on each of its 54 MHz wide Optus B3 transponders; 22 total. Tests for the Optus DTH service (underway at this time) place 8 programme services on each transponder. Sky NZ has been variously quoted as planning between 8 and 15 programme channels per (54 MHz wide) transponder but unfortunately for Sky their full complement of three transponders will not be available before June/July 1999. This means Sky will be forced to start their digital in phases, adding additional channels in significant groups twice after their initial start date. It will be the latter half of 1999 before Sky is able to market a full programming package and this will complicate the challenge of public perception.

If you were planning FTA channels as an incentive to consumer purchase of their own DTH/TVRO systems, at what point would you add the FTA channels? Within the first transponder, the second, or the last? Logic suggests it will not be in the first set and Sky has repeatedly told us the third transponder will be largely (although perhaps not totally) pay per view services (NVOD movies). This suggests that if Sky does elect to load their package with FTA service channels, those channels are most likely to be in the second transponder (January 1999 or after).

The major challenge facing Sky, and Optus, is to make their new DTH digital services seem appreciably better than what the consumers already have access to view. In the Optus case, the competition is the Galaxy/Australis DTH package. In the Sky NZ case, their satellite service must be more appealing than their own terrestrial package. (5) Sky's initial 12,000 terminals sold to analogue

5/ "Available only on satellite" will become the marketing phrase. A second sport channel, built around New Zealand and overseas cricket, is planned and will include material from ESPN-2. A second movie channel, Hallmark Entertainment, is also scheduled.

satellite viewers represents approximately 4% of the households that can only be reached by satellite (i.e., beyond the reach of existing terrestrial TV transmitters). There is a measurement here that says 4% of New Zealanders will pay sizeable dollars (NZ\$650) to have access to the national sport (Rugby). In portions of New Zealand within reach by terrestrial means, the Sky penetration is in the region of 23%. Sky's programming mix after they launch digital service will determine how long it takes to boost satellite penetration to the levels of terrestrial, and, whether terrestrial subscribers will in fact "upgrade" to services "available only on satellite."

Satellite Receiver / IRD Box Score April 1998

Integrated receiver decoder (IRD) and analogue receivers now entering the market, or being repriced in the marketplace as monitored by sister publication SatFACTS Monthly.

ADI Corp. (fax ++886-2-2713-6555), Taiwan: MediaMate DVS-820 (Msym 3-30), NTSC + PAL; DVS-821 (Msym 1-45, RS-232, Teletext, twin SCARTS + RCA, NTSC + PAL). Pricing not yet established.

EFA Corporation (fax ++886-2752-4260), Taiwan: P-2000 MPEG-2/DVB. MCPC and SCPC, claims smart card but does not define CA system. Pricing not established. SCART/RCA, S-VHS, smart-card ability claimed (not defined as to CA format). Pricing not established.

Nokia models 9602 and 9600S. Latest European-released models claim full PowerVu and glitch free NTSC performance with built in Viaccess (9602) and Irdeto (9600S) conditional access capability. European pricing in region of FF2500.

Palcom (fax ++44-1372-360-322) DVB-1000R consumer FTA receiver, Msym 1-45, remains on schedule for initial delivery in testing quantities late in April. Advance information suggests this receiver will establish "next generation" of features for FTA use; pricing US\$250 in container lot loads to distributors (1,100 units).

Palcom model 7700 analogue receiver equipped with 7 steps of threshold extension, widest range yet of audio processing options, "Auto Focus" (automatic) tuning of any transponder with built-in dish drives for both azimuth and elevation motors. Unit has anticipated availability early to mid-May, likely installer/dealer price in region of A\$550.

UEC Model 642: Irdeto equipped MPEG-2 receiver has been apparently approved for use with Optus Aurora platform, should also be compatible with Optus planned DTH service platform in Australia.

Scientific Atlanta (fax 61-2-9451-4432 - Elizabeth Jennison), Sydney. Promoting D9234 for Japanese NHK service PAS-2. Receiver is US\$1,195 + US\$150 transportation from Canada + (for trans-shipment inside of Australia) Customs duty of \$11.34 and Sales Tax of \$102.76 for total of A\$2333.35 (approximate) Australia.. SA claims receiver will do FTA NHK World TV (which, by the way, NHK also advises a Hyundai HSS-100C and Nokia 9200S will work for - as undoubtedly will any MPEG-2 receiver capable of handling PowerVu NTSC), and, NHK Premium TV (which is pay TV service in PowerVu and therefore requires SA format receiver).

Scientific Atlanta model D9234 for GWN service bouquet. SA telling people they should NOT purchase this unit with intention of using it for NHK service, claims the software "layer" is not compatible with the NHK project. Reason why people would like this one rather than NHK specified version of D9234? Cheaper price - under A\$1,450. Truthfulness behind SA claim that GWN IRD will not perform on NHK? Only time will tell.

Stong UK Ltd., (fax ++44-171-491-7575) UK SRT 4000 (FTA, Msym 5-45), RS 232, DiSEqC LNB switching, 2 SCARTS. Pricing not established.

Unknown (branding). Combination analogue (400 programmable channels) and MPEG-2 FTA digital (500 programmable channels, SCPC and MCPC). Analogue has 18/27 MHz IF bandwidth, 32 steps of threshold extension, 6 audio bandwidths (130 through 500 kHz). Digital has MPEG 2 DVB, MPEG 1 (audio layer 1, 2), RS232 port, signal level reading, auto installation, teletext, DiSEqC version 1.0. Distributors being 'courted', naming and pricing to follow.

Status of DTH Pay TV Programmers / April 1998

Galaxy/Australis. Closing Queensland offices May 31 or prior. Using two Optus B3 transponders with 22 programming channels (#22 is test). Financial future significantly complicated by pending and underway law suits involving mortgage holders and stockholders.

Optus Vision (DTH). Testing 16 programming channels on two Optus B3 transponders, possible commercial start in June-July time frame (September-October also mentioned) with possible tie-in to Galaxy for programme sourcing and subscriber management infrastructure (subject to lawsuits now underway.).

Sky Network NZ. Two Videocrypt analogue services currently functioning; testing of MPEG-2 proprietary CA system bouquet on one B1 transponder will begin between May and September with earliest commercial service date September. No formal announcement of IRD supplier at this time (will NOT be Irdeto).

TECHNOLOGY BYTES

...BITS and BYTES you may have missed in the rush to make a dollar ...

April 1, 1998 ♦ VOLUME 98-3-46

Satellite TV & Radio

French feed from Paris to Pacific, currently carried on Intelsat 180 in MPEG-1 format, will switch to MPEG-2 the night of April 25 to 26. The feed includes TOM1, TOM2, Canal + Polynesia and Canal + New Caledonia (there is a time offset between the two). This feed in MPEG-2 will be conditional access, and although it may be testing for short periods prior to the switchover in FTA, it will not be routinely FTA. There have been reports of testing on the RFO 1180 frequency (4055/1095RHC; 27.495, 3/4 with 4 video programme channels of Canal + One, Canal + 2, RFO 1 and RFO 2) but this would appear to be a test only. The actual frequency of the new MPEG-2 service is not known at this time.

Related, but not the same. RFO Tahiti still hopes to convert from analogue to digital with a current target of June of this year. The bad news is that when RFO does go digital, they will definitely switch from their present Global to the East Hemi beam which is likely to cause total signal loss of this service for the mid and western Pacific.

Hoopdorf (Holland) testing by Irdeto of UEC and Comstream/Panasat IRDs for possible certification and use in Optus Aurora platform finished more than a week earlier than anticipated. There has been no formal announcement as to which receiver (if either) "passed" Irdeto tests but activity on the ground in Australia since the tests wrapped up suggest both firms did pass and Optus is likely to have its first Aurora platform receivers before June 1st (CTD 9802, p. 8). Nearest thing to verification of Hoopdorf testing results - query to Optus by firm proposing modification to software routine for present Optus DTH tests was referred to both UEC and Comstream with Optus assurance *"both firms will be supplying receivers to the Aurora project."*

Divicomm, compression equipment supplier to Optus Aurora project and likely supplier for Optus DTH, is claiming significant improvements in "compression without degradation" technology. Here is the concept: Normal compression technique is to run analogue video source through compression "engine" and then to broadcast. New technology sends the once compressed video data stream through second "engine" which results in refinement of compression. Divicomm (and others) call this "stat-mux" (statistical multiplexing) which is an automatic (rather than human operator) dynamic compression technique which allows real time adjustments to the compression processing based upon the instant video material being transmitted. Divicomm encoders (US\$7,000 - \$8,000) with stat-mux, the firm claims, can add 50% more TV programme channels to a given bandwidth "without viewer complaints."

Tektronix has introduced a digital TV analysis system that allows engineers at origination point to determine the degree of "watchability" when various levels of compression are selected. System analyses video signal before and after compression, assigns Tektronix developed scale between 0 and 20 to measurement result. 0 represents no artefacts, 20 is too many to count and 15 is considered "unwatchable." Engineers who have attempted to quantify degradation as compression increases have been forced to rely on "eyeball" analysis until now. Price? US\$65,000.

Sky (Horse Racing) Channel, the Australian service on AsiaSat 2 jointly owned by media barons Murdoch and Packer, is being sold to the New South Wales TAB for a price reported to be in the range of A\$250 million. NSW TAB, to be called TAB Limited in a new public stock float, will apparently become a national (Australian) horse racing channel with an eye towards being as universally available as possible. The channel to date has been largely very expensive (in the range of \$10,000 per installation user fee, A\$2,500 per year) and available only to those who can afford such an expensive access to live horse racing. Under TAB Limited, there is talk of the channel being distributed via satellite internally within Australia as a free to air service. There will be problems as NSW TAB has been in a highly competitive battle with Victoria and Tasmania horse racing venues and the purchase of the Sky Channel service puts pressure on Victoria and Tasmania to compete and survive. If the NSW operation does go FTA, it will be approximately 1 August in starting and talks are underway with cable and DTH operators to determine whether existing STUs (set-top units) now in homes can in any way be configured to allow at home punters to place bets through their existing STU installations.

Undated advisory with fax machine date of March 23 over signature of Tim Mason, Chief Engineer for Alice Springs regional telecaster Imparja verifies CTD report of March 4th. The broadcaster has selected the Optus

Aurora platform over competitive Telstra/PanAmSat package that requires single-use Scientific Atlanta D9234 receiver. Announcement says, "*We will continue to use the same B3 satellite as our existing BMAC service (and) the Aurora platform will also carry the ABC's central Australia service, so you will continue to receive all of your TV and radio services without having to move or replace your existing dish.*" (Tim Mason, tel 61-8-8950-1450)

GWN and Optus battle. GWN discontinued feed through Optus BMAC uplink March 1, Optus went to Australian Broadcast Authority for ruling on whether it could put the GWN signal back up without incurring liability. ABA ruled they could and issued public statement to that effect. And Optus put GWN back up on BMAC. This lasted less than 24 hours, then GWN cut them off again. How? Imbedded in most conditional access schemes is a system that places the electronic address of *each decoder* inside of the video output. Thus if, *for example*, Optus acquired a GWN D9234 IRD and used it as a "feed" for their BMAC service, with the appropriate equipment it is possible to go into the video stream of the BMAC service and locate the identifier number of the IRD that is actually receiving the GWN service at Optus. If you know the identifier number, it becomes a simple matter to "address" that specific unit over the air and turn it off (as in deauthorise it). GWN attracted plenty of Western Australia bad press for taking this step, Optus decided GWN was harming itself more than they ever could. A second, competitive to GWN, WA regional TV service is coming up for approval. We have not heard the last of this one, yet.

GWN D9234? Will this service-specific receiver "do" anything other than GWN? Reports from skilled users suggests it will. Software, SA says, is configured to *only* recognise GWN bouquet - a purposeful step to discourage people from acquiring this Australian government subsidised unit rather than more expensive software versions of same receiver for reception of NHK and other bouquets. To use GWN receiver on alternate services, first force receiver to factory default settings or alternately rotate LNB away from GWN feed (to opposite polarity) and enter new numbers. It is also possible (details lacking) to hold GWN in memory and also load a second service (such as GWN at 067 and Mediasat at 000).

NHK Premium service, being offered as a pay-TV service through new digital bouquet (see p. 13, here) involves single source Scientific Atlanta D9234 receiver. Of interest to those who would like to know how much SA's Sydney office pays for this receiver - "NHK BSR ORDER FORM" for this receiver from SA shows, "*Sales tax (sales tax will apply unless a signed sales tax exemption certificate is attached) - (A)\$102.76.*" Curious minds wondered why a receiver that sells for US\$1,345 to the dealer/installer would attract A\$102.76 in sales tax. The answer is more curious than the question. "*We apply the sales tax at the point of entry cost*" says SA. OK, so if they are paying \$102.76 in sales tax, what is the SA Sydney office being billed for the SA Canada origin D9234 receivers? The applicable sales tax is 22% and \$102.76 indicates a landed price for SA Sydney of A\$467.10 which in turn (depending upon which day you do this calculation) comes out at around US\$303 per receiver. There are three possible answers here: (1) SA does not know how to compute import sales duty on US\$ receivers and has screwed up, or, (2) SA does know how to compute this and the \$1,195 receiver (plus US\$150 transport cost from Canada - US\$1,345 total) represents a mark-up of 394% on \$303 cost or 444% mark-up on \$1,345 price, or, (3) SA is misleading the Australian customs authorities concerning what the D9234 is really costing them from SA Canada. Of note: The US\$300 range is what Irdeto family conditional access IRDs cost programmers world-wide at this point. And there is "less inside" the D9234 than a standard Irdeto equipped CA IRD. Three hundred and ninety four percent mark-up? *Gracious.*

Can NHK D9234 also do any other services? SA Sydney is discouraging such speculation, possibly because they do not know the answer. One question being asked - can such a receiver also be authorised for JET-TV (also on PAS-2 but on opposite polarity)? SA is claiming (without any substantiation as we go to press) that the "*NHK version D92324 operates at a higher level of conditional access than previous models, including the commercial D9223.*" They further claim the newest level of PowerVu CA is not backwards compatible to levels in use by programmers such as JET-TV. This SA statement although JET-TV has within the past month sent new upgraded software to all user receivers. That SA should want to discourage anyone from using the single receiver for both NHK *and* JET reception is understandable - SA would prefer to sell you two receivers (even if you really only need one). There is a potentially bigger problem. The way PowerVu works, if a receiver is in the address stream for a service such as NHK, *SA considers* that receiver "belongs defacto to NHK." In other words, before a D9234 owner can discontinue using the receiver for NHK and move it to another PowerVu service, SA's authorisation centre for PanAmSat has to have approval in writing from NHK to take the receiver out of the NHK control stream. Yes, you may be buying the receiver, and yes you may *think* you own it. But, in fact, you can *only* do with that receiver what SA + the programmer who initially authorised the receiver *allow* you to do. So now the practical problem of getting NHK to also agree to using the same receiver for JET. NHK and JET are not only competitors, they are quite bitter competitors. JET has nothing good to say about NHK, and NHK responds by ignoring that JET even exists. The likelihood that you could go to NHK and get their permission to have one of the receivers which they control through their authorisation stream to *also* be authorised for JET is

Clearing Up the NHK Digital Transition Confusion

Japan's public broadcaster NHK is one of the world's largest state owned, non-commercially sponsored television and radio broadcasting services. Their NHK World analogue TV service has been available through PanAmSat 2 on C-band to dishes in the 3m size (New Zealand and Pacific; down to 1.8m in size for eastern Australia where the signal level is higher) for several years.. On April 1, NHK shuts down the analogue service on their present transponder (4035/1115 Hz) and replaces it with a Scientific Atlanta PowerVu digital service. Of note: The analogue service will continue until at least July 31 (1998) on a less powerful PAS-2 transponder (4055/1095Vt) perhaps using only 1/2 of the transponder. The number of Japanese related families and groups currently benefiting from the NHK analogue service in the Pacific is measured in the thousands, probably under 5,000.

NHK's decision to use PowerVu is understandable if not commendable. First, PowerVu is the "official" digital format for satellite operator PanAmSat. And NHK plans to augment their present NHK World service with one and ultimately more than one "pay TV" programme channel as well. Thus the NHK digital service will be a "bouquet" (see parameters, below). The good news: "NHK World" will be FTA MPEG-2 PowerVu and accessible with a variety of receivers.

The bad news: "NHK Premium TV" will NOT be available on a DTH basis; only to cable television, SMATV (under criteria not yet firm) and "Japanese social clubs" outside of Japan.

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To access NHK World, simply obtain an appropriate receiver (Hyundai HSS-100C, MediaStar D7, Nokia 9200 or other PowerVu compliant Nokia, and doubtless others) and enter the parameters below.

To access NHK Premium on behalf of a cable system, SMATV system (for which you can expect some protracted correspondence) or a Japanese "social club" (which will also create protracted correspondence):

- 1) Contact Mr. Katsumi Kuwae, NHK Joho Network, Tokyo at tel + +81-3-3485-7730 or fax + +81-3-3485-8677.
- 2) You will be quoted a price based upon the number of viewers (cable TV subscribers in the case of cable TV or SMATV). You will receive a programming subscription form which must be completed, returned to NHK Joho, and accepted - before,
- 3) Go to Scientific Atlanta in Sydney (Elizabeth Jennison at tel + +61-2-9452-3388 or fax + +61-2-9451-4432) and ask for their form "NHK BSR." This is an order form to purchase an SA D9234 receiver. Slightly more than half way down this order form page is "Section III" which is titled "Confirmation by NHK JOHO NETWORK."
- 4) This portion of the form must be completed (requires an NHK signature, responsible party name, reference number and date) before you turn in the order form to SA for the D9234 receiver.
- 5) With the completion of the order form, you make payment to SA Sydney (US\$1345 no matter where you are, plus A\$114.10 if you are in Australia). Form NHK BSR provides payment instructions.

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Also of some importance. The precise content of the new FTA digital NHK World service is not well detailed. and will only be known after it begins operation. One well supported NHK source report says it will *not* be the same as the until-now-available analogue service, will be basically a "news wheel" with significant "down times" between news programme transmission times. If this is the case, expect "NHK Premium" to be more like the until-now NHK FTA analogue service with perhaps a few movies and extra sporting events thrown in. NHK clearly intends to make money with their digital bouquet. Check www.NHK.or.jp for assistance.

NHK Tuning Parameters as of 1 April 1998

Digital: PAS-2, 4035/1115 Hz, Msym 26.470, FEC 3/4. NHK World FTA in PowerVu format, NHK Premium PowerVu conditional access with subscription restrictions (not available to DTH).

Analogue: PAS-2, 4060/1090 Vt, NHK World (FTA) reportedly in 1/2 transponder format and only to July 31, 1998 termination.

Look Out - Here Comes the Next Generation of Super Chips!

Major chip designers and manufacturing firms displaying at first quarter U.S. trade shows are unanimous in their forecast that "*You ain't seen nothing yet!*" devices are just around the corner - 12 to 24 months away. Much lower (5v) voltage operation (which instantly reduces battery use on portable devices) will be universal and heat generation in MPEG video devices will soon be a thing of the past. Leading the list, very low cost MPEG encoder and decoders - on - chip will make possible smaller, low cost, digital camcorders, DVD recorders and mobile PCs that operate days rather than hours per battery charge. To speed up processing time (essential for digital decoders and encoders), newest chips perform MPEG calculations in two parallel operations. A single 100mm square chip using 0.25 micron CMOS technology will contain the equivalent of 5.5 million separate transistors. Mobile telephones, including those for new satellite mobile phone services, will use MPEG-4 standard technology at 70% less power consumption than current devices. Toshiba device for this application fits 3 million transistors on 9mm square chip. One application being promised for MPEG-4 chip technology - video for telecom links. Major design emphasis is being placed on DTH applications and need for complete "system - on - a - chip" technology to allow plug in decoding of digital TV for TV sets, set-top converters. Present technology claims "under (U.S.) \$250 set-top DTV to (NTSC/PAL) converters will be practical in quantity in early 1999."

Bottom line in all of this new chip technology: *Products sold in 1998* will be last of current technology designs and every product area from satellite IRDs to portable telephones will be significantly altered in size, price and function capabilities by mid 1999.

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Almost immediately after these new super chips are the next-next generation devices which designers say will operate on 1.8 volt source. SGS-Thomson says it has developed a chip (using technology they call HCMOS-8) that interconnects tiny transistors with copper wires measuring only 0.00025mm in diameter. This miniaturisation will allow further reduction in total chips required, leading us directly to the long awaited wrist watch size GSM telephones (the band will be the antenna). Increasingly in the chip world, the future is today and "*you ain't seen nothing yet ...*" is but tomorrow.

someplace between 0 and minus a million. Even if you somehow did this, then you have to get identical written permission from JET. How do you spell loud, uproarious laughter in Japanese?

TV Chile service, carried for last three months within California bouquet on PAS-2 PowerVu, has been running on screen announcement notifying viewers it intends to cease transmissions April 15th. On screen contact numbers, when contacted, fail to respond. Service was believed to be for Chilean Islands 2,000 miles west of South American coast, but TV Chile never confirmed real reason they were on PAS-2 in the first place.

NTV Moscow is operating AsiaSat 1G (122E) on 3675 RHC, SECAM and 7.00 MHz audio.

Status report for Squarial. Every satellite dish system to date has used one form of parabolic antenna or another. That era would seem to rapidly be coming to an end, at least for 12 GHz (Ku band) DTH applications. Fortel International, which claims to have a plant in Malaysia where 2.2 million aerials will be produced over the coming 12 months, has given public demonstrations of their antenna system which in turn have attracted highly complimentary reviews. The Squarial is flat, measures 19x19x1.5" (483x483x38mm) in Ku band form: 8X8x1.5" in Ka (19/20 GHz) band format. The traditional parabolic antenna is really two part: The "dish" portion is a signal catcher and focusing device, totally passive. It points at satellite, captures radiated signal energy impinging upon its curved surface, and through reflection rebounces the captured energy to a central "focus point." The second part of the dish is the "feed antenna" which collects the focused energy that is bouncing from the curved dish, channelling it to the LNB (low noise block down converter) for amplification. *The Squarial has no reflector.* Inside the encapsulated 1.5" thick surface is a network of tiny "waveguides" which collect the energy which a dish would reflect to the secondary feed antenna. The energy captured inside of the waveguide elements flow to a central collection point where the LNB is installed. Squarial backers claim their antenna turns 85% of the energy intercepted by the waveguide collectors into useful reception energy. Most parabolic (dish) antennas average under 60% "conversion efficiency," primarily because the energy intercepted by the reflector is only partially captured by the secondary "feed antenna." Fortel International claims their Squarial can be more easily mounted (it requires only a flat surface pointing in the general direction of the satellite) and is provided with a set of mounting arms allowing one time adjustment of pointing direction and angle. They also claim the antenna is sensitive enough that Ku band signals can be received through a glass window so the antenna could be located inside of a building. A caution or two about this statement: The

POSTSCRIPT - Taupo Cablevision Auction and Telecom NZ Equipment Disposal

CTD for March 4 reported that Taupo CableVision was being forced into an equipment disposal auction by prime bank lender BNZ on March 12th. The results of that auction.

The crowd was small, averaging 30 or fewer people, of which no more than ten had an interest in the actual cable plant (17 vehicles were also on offer). The BNZ bank loans that caused the auction to happen reportedly were for \$550,000 (against building, land and cable system) and \$150,000 against rolling stock equipment. One auction bidder claims to have offered NZ\$850,000 for the complete cable system business, "as it stood," the week prior to the auction. Coopers and Lybrand, probably on authority from BNZ, turned down the offer. There were ample "good buys" during the auction, some for under ten cents on the dollar of real value. For example:

- ✓ The complete cable plant (everything but the headend, the land and buildings and the inventoried, unused equipment) sold for NZ\$10,000. No misprint here; a modern fibre optic and coaxial cable hybrid plant passing a claimed 4,800 homes for \$2.08 per home passed. It does not get any closer to "free" than that.

- ✓ Scientific Atlanta model D9223 PowerVu receivers sold for NZ\$375; their price at SA these days is upwards of US\$1,650. NTL DVM 3000 receivers sold for NZ\$250; list price at distributor Skandia Electronics is A\$3,800. Less exotic MPEG-2 FTA and Irdeto equipped IRDs at NZ\$300 (versus upwards of NZ\$1,000 in the real market).

- ✓ 74 rolls of .540 Commscope cable, nominally valued at something more than NZ\$1.75 per metre, sold for NZ\$0.25 per metre (two reels of the same cable sold for NZ\$0.06 per metre only because they were stored away from the larger lot).

- ✓ 5m RSI (brand) quality dishes were less of a bargain (but certainly well below market at \$5,000 each); a ten metre RCA dish was first offered at \$6,000, and ultimately not sold. Reason? Dish is a monster to reconstruct, will require up to \$5,000 in new bolts and nuts and sits on "king post" mount that is 4 feet in diameter (translation - even if the dish is "free," the cost of putting it back into service runs well into 5 figures).

Fibre optic cable got no takers - at any price.

It turns out that 90% of what is needed to turn the cable system back on and begin operating again was purchased by one buyer at estimates of under \$50,000. There are some practical problems to sort out - two fibre optic receivers, necessary to bridge between the cable headend and the coaxial cable portion of the plant are "missing" (and will cost around \$25,000 each to replace). The headend building (with offices, studios, spare parts storage) was to be handled as a separate "tender sale" shortly after April 1st. And - the status of the pole attachment agreement remains clouded. Electrical company Trust Power was negotiating with potential buyers of the system right up to auction day, was apparently willing to reduce the pole rental charges by 40% from those under contract to TCI. The exact legal position of the electrical company is not clear as their contract with TCI gave them certain rights of possession with the cable TV equipment attached to their poles in the event of a default by the cable operator on payments owed.

There were no winners in this, one attendee told CTD, *"It was an extremely depressing situation. The Theakers (owners) had obviously put their heart and souls into the project and to see it sold off for just pennies on the dollar must have been very disheartening."* In fact, because the system and inventory sold so cheaply, the Theakers may have legal recourse in claiming the equipment sold for far less than market value. New Zealand has a law protecting those in bankruptcy in such a situation and courts have previously decided in favour of the bankrupt parties in similar circumstances. (Ron Theaker at 64-7-377-2999)

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Meanwhile, in Napier as CTD also reported on March 4th, the First Media (Telecom New Zealand) huge inventory of cable, connectors, amplifiers and associated cable TV parts has steadily dwindled since our last report. Some sizeable (container load) purchases of larger diameter trunk coaxial cable have been made in the region of up to 40% off of the Telecom "inventory" price sheets.

The "sale" period has been extended (was originally to close at the end of March); for a nine page inventory list of available equipment contact Mark Harrison at (tel) 64-6-831-0200, extension 6874 or (fax) 64-6-831-0277.

percentage of lead and contaminant content in a particular piece of window glass will determine whether this is actually practical and no absolute rule can be assumed by their claim. The initial Squarial antennas are capable of performing with either linear or circular polarisation (different models for each capability) and apparently are suitable for Ku band reception when the satellite's footprint is in the region of 46 dBw and above. The absolute threshold (minimum signal available) has not been published and doubtless testing in the future will add to our knowledge here. The antenna has a multi-layer plastic exterior, can be finished (painted) to blend in with a household exterior.

DBS operator Hughes (DirecTV) has awarded an exclusive 5-year contract to American manufacturer Blonder Tongue Labs Inc. to produce SMATV and cable TV headend processing equipment.

Unusual satellite DTH marketing plan. U.S. firm Unity Motion plans to distribute high definition digital TV services on an unnamed satellite as tool to sell high end 72"/1829mm home theatre DTV satellite + home display receiver systems. Buyers of new system at undisclosed (but certainly not inexpensive) pricing will receive first year satellite programming without charge, to later be available on subscription.

U.S. Primestar TV (DTV) transition to MPEG-2 digital will use General Instrument proprietary DigiCipher II technology.

Falling retail pricing for DirecTV (DSS brand) DTH service in North America is driving more than half of the equipment manufacturers licensed for this technology out of the business. Complete DTH systems for DSS are being sold at pricing as low as US\$99 while market share leader Thomson (RCA) at 36% and Sony (26%) are offering dealer sales incentives to spotlight their brands against also-ran competitors. Toshiba, with 11% share, has stopped DSS production for now and Hitachi (7%) is conducting close-out pricing sale. Others stopping production or electing not to offer new models (while existing inventory closes out) include Samsung, Daewoo. The one hope for bigger market shares and improved profits comes from the introduction of HDTV via DTH later this year.

Telecom NZ parent Bell Atlantic has gone into the home satellite dish world, becoming a distributor within its market area for DirecTV (DSS). BA has purchased a "quantity" of DSS dishes, plans to "lease" them to customers. Telephone firm believes customers will switch away from cable to DSS when they offer package that has no significant up front cost (current DSS systems range from US\$200 to \$500 depending upon options.)

Digital TV & Radio

Australia's government has approved a plan to allow existing commercial television broadcasters to gain access to new 7 (8) MHz bandwidth spectrum for the conversion to digital terrestrial service. The broadcasters have attempted to gain the new spectrum space along with government approval to allow them to individually decide *how* the bandwidth will be utilised. In the United States, a similar digital transition programme allows the existing TV broadcasters to use their new channel space for the transmission of HDTV, SDTV (standard definition TV), as well as allowing them to transmit two or more compressed digital channels in the new spectrum space. The Australian terrestrial broadcasters had sought a similar right. A cable television lobby opposed government creating new TV channels for digital and "gifting" the existing broadcasters with the new space, arguing that cable and satellite operators have paid for their spectrum. The decision rules terrestrial broadcasters will not be charged for the one-for-one digital replacement bandwidth, but they will be restricted as to its use. National networks must launch digital terrestrial TV by January 1, 2001; regional broadcasters have three additional years for the conversion. The initial decision announced by Communications Minister Richard Alston rules terrestrial broadcasters may only use the digital spectrum for the transmission of a single HDTV channel per 7 (8) MHz of bandwidth. This restriction may be lifted for ABC and SBS, however. The broadcasters are pleased to have their digital transition bandwidth without being charged spectrum fees, unhappy they will be restricted from using the spectrum for multiple programme channel service. The cable operators are unhappy with the decision because they believe the broadcasters should be required to pay for their new digital spectrum, but relieved that with the decision the terrestrial broadcasters will not be competing with cable or DTH multiple channel capacity. New Zealand has adopted *no* national plan for digital TV, and a spokesman for the Ministry of Commerce told CTD on March 27, "*We remain convinced that as the broadcasters now own the spectrum, and are free to purchase additional spectrum if they require it, that the marketplace will sort this issue out.*" TVNZ has repeatedly said, "*We are not planning to offer digital television*" although the SOE does digitise a trio of local service channels for the First Media (Telecom) network. TVNZ's Reg Russ repeats the TVNZ party line that, "*Going digital with TV1, TV2 and MTV is not for TVNZ.*" TV3's Director of Transmission, Gerry Smith, believes "*there are not many free-to-air broadcasters around the world getting excited about going digital. For us to go digital, you are talking in excess of \$40 to \$50 million with no real payback. This is something that will make television set manufacturers very happy because it's the opportunity to turn over all of the existing sets. It is not as if we can increase our coverage or revenue at all.*" The New Zealand attitude represented by these recent quotations runs contrary to virtually every other country in the world and ignores the question of how the New Zealand TV retailists will deal with the end of analogue TV set

Real Time, Live TV Via Internet? The Latest Technology

When Telecom New Zealand pulled out of their First Media Cable TV project (CTD 9710, p. 8), they claimed "rapid advances in ADSL technology now makes the need for fibre optic and coaxial cable (high bandwidth) distribution systems no longer necessary." They eluded to the "soon" availability of ADSL technology which has the capacity to compress television in real time to bandwidths which can be transmitted through existing telephone lines. What is the REAL status of such technology?

The world's first commercial attempt to transmit a selection of television programming to waiting PCs is now testing on Internet under the trade name SimplyTV (www.simplytv.com).

To visit this site you need a Pentium-equivalent PC loaded with RealSystem 5.0 video player software, or, a Web-surfing set-top box with a (very) fast modem. What this will get you is TV programming at something less than full motion video (how much less is a function of the "line" condition between your PC and the web site in Seattle, and, your equipment). Can you connect to this site and actually get full 30 frame per second (fps) video (this is an NTSC service so be advised)? The answer is yes - what you need is a 128 kbps ISDN modem or universal ADSL connection. If your modem is capable of today's fastest available 56 kbps, you will "approach 30 fps." Modems that run at 33.6 or 28.8 kbps will see progressively less real time. Before you get terribly excited about this, check with your telephone supplier to see just how many years away connection to a 128 kbps ISDN line might be for your location. While you have them on line, also ask what the cost per month will be for such a high speed connection.

Meanwhile, at SimplyTV they offer you a menu of TV programming, claim there will be 1,000 half hour "shows" available by mid-year. Access to individual shows will be on-demand, they say, and their target audience will be people who are not served by mainstream broadcast television.

Now, assuming you do have 128 kbps ISDN to your PC, what can you do with the material delivered to you? You can watch it. But you are unlikely to be able to store it for later retrieval because frames are sent to the PC in a "streaming" sequence, the PC stores just a few frames at a time in cache memory, and erases the stored frames as new frames arrive. Could you somehow loop to a VCR and store the frames? Not yet. RCA, however, is developing a "mass storage" box which holds out the promise of being "looped" after the PC for storage, and then a VCR could be placed after the mass storage unit to record the video in "real time." This does not exist today, you can watch it at various levels of "jerky motion" video display (again, a function of your equipment and the line delivery capability between you and Seattle) but storing it for later use is not practical.

SimplyTV, by the way, is advertising supported which means your programme access costs will be determined by your line charges for Internet use and of course the not inconsequential cost of the leading edge hardware and software required to get into the service.

Internet TV for the average home in New Zealand or Australia, through the telephone lines? Still coming, but not here yet - as Telecom NZ knows but ignores in their press releases.

production over the next 5 years. Mitsubishi's announcement (CTD 9802, p. 18) it is ceasing production of direct view (CRT equipped) TV sets by midyear and would phase out analogue TV receivers within 2 years is not good news for a country that has no digital TV plans in place.

What is definition of HDTV? Digital is not, alone, high definition. As satellite and cable programmers have discovered, a digital signal can actually provide lower "line" or "pixel/dot" resolution than analogue and in some situations the financial advantage of significant compression (reduction in image quality) outweighs the possible adverse feedback from viewers who on occasion actually do demand a maximum definition image. It all comes down to how many lines of video material, and how many image points (pixels, dots) are included within each line. DTV (digital television) formats of 480i and 480p are not HDTV. A 1080i image, on the other hand, would be considered high definition. The difference in pixel/dot count is substantial; as low as 236,000 per image frame for 480i and as many as 1,900,000 per frame for 1080i; a difference of 800% in image pixel content. Intermediate line counts such as a proposed 720p standard would deliver 830,000 displayable pixels per frame. The marketing folks are already hanging names on these variations - SDTV (standard definition television for the 480 region), EDTV (enhanced definition television for the 720 region) and HDTV for the 1080 line images. For broadcasters with the legal right to do so, a standard VHF or UHF channel can accommodate a single HDTV image or it could deliver some number of EDTV or a greater number of SDTV programming channels, simultaneously. The commercial incentives, at least at this time, is for SDTV or at most EDTV. The folks who

created HDTV, the Advanced TV Systems Committee, says "true HDTV can only be accomplished with 720p (1,280 pixel width) and 1080i (1,920 pixel width)."

Dallas-Fort Worth pioneering DTV station WFAA created chaos with heart monitoring equipment when it began telecasting on newly assigned digital channel. Under U.S. FCC regulations, unlicensed devices including heart monitoring equipment are authorised to operate on TV channel spectrum space not in use in their area. WFAA operates normally on U.S. TV channel 8, was assigned channel 9 for DTV purposes. With channel 9 previously not in use, Baylor University Medical Center had over the years installed devices for medical monitoring purposes. Hospital is ten miles from WFAA digital TV transmitting antenna, a separate facility 28 miles away using same (channel 9) frequency was not affected. WFAA promptly shut down their DTV operation to allow the University to modify their monitoring equipment, reportedly at a cost of US\$200,000. Station was not liable for interference as it operates with federal license; hospital had years ago elected to used unlicensed frequencies and had no legal right to expect protection from such interference.

Consumer Electronics

Zenith Company in U.S. continues to lose "millions each month" and is reaching hard-line decision to save company from close down. Firm pioneered radio receiving sets in 1920s, television in 1930s and was first to design subscription television service (1940s). Among many moves, firm has reduced number of models in TV set line to 25 for 1998 model year (down from 57 as recently as 1995). To cut sagging TV set sales in 1997, Zenith gave consumers written guarantee that any (32 - 60") analogue TV set they purchased during year could be turned in at full purchase price for a digital model at a later date (when digital is available). Zenith is currently majority (57%) owned by Korea's LG Electronics (formerly Goldstar). New Zealand's Sky Network TV has been talking with Zenith concerning their "Worldbox IRD receiver" for digital TV operations.

U.S. slump in direct view TV set sales reversed in January, producing best sales record for month since 1993; up 17% over last five year average. Simultaneously, sales of 30" and larger big screen sets were up 20%; 1 TV in 25 now sold in U.S. has a screen size larger than 30"/762mm. Sales increases also came to camcorders, up 13% over record 1997 January. Stereo sound was included in 55.3% of all TVs sold in January.

Price squeeze on VCRs in U.S. market continues to be major problem for VCR makers. February study shows 85% of all VCRs now sold in North America retail for under (U.S.) \$250. Latest price slashes in market where profits have eroded to point of being non-existent - two head models for under (U.S.) \$90, 4-head mono machines at \$119, 4 head hi-fi (stereo) at \$139. In shrinking profit area, most retailers are cutting back on "shelf space" for VCRs, finding less and less to differentiate between models and brands. Very top end S-VHS models, with perception of highest VHS quality, accounted for only 0.06% of total market in 1997 with average retail price of (U.S.) \$478.

Sony believes price squeeze, especially troublesome to high end suppliers in VCR area, can only be "corrected" by the transition to digital. In outlining marketing plans, Sony cites 4% drop in TV set sales world-wide in 1997 and 10% decline in pricing for larger screen TV sets.

Still controversial Divx format for digital video disc (CTD 9802, p. 18) has signed Fox as its fifth studio source for films. Fox along with Paramount have refused to release movie products on standard DVD format to date, alone amongst all major (and not so major) movie studios. Divx plans to offer their proprietary format in home DVD players at U.S. \$599 late this month (April), sourced from LG Electronics U.S. subsidiary Zenith. Major Fox titles to be included in first releases - "The Edge," "Alien Resurrection" and "Full Monty." Divx is creation of Circuit City store chain, differs from standard DVD because discs are authorised through telephone modem for unlimited play within set time window (typically 48 hours) and are then "disposable." Pricing of Divx format DVD discs will be near US\$5 which compares favourably with VHS tape rental of same genre films.

DVD launch in UK has 11 companies in line for official start of new distribution service by mid month (April). UK DVD hardware and software suppliers have agreed to "soft launch" similar to test marketing initially done in USA one year ago, with intention of having as many as 300 DVD film titles available before the Christmas season. Hardware suppliers include Sony, Toshiba, Panasonic and Philip with as many as 400 retail outlets likely to carry discs initially. Audio format remains unsettled because of European wide distribution expected shortly; many films on DVD will carry both AC-3 and MPEG-2 sound.

Matsushita, after Mitsubishi announcing end of analogue TV set production (CTD 9802, P. 18) has now announced end to production of full size VHS camcorders to concentrate on VHS-C and new digital format units. Of perhaps related interest: Matsushita expects to ship 9 million cellular telephones in fiscal 1998 and 7 million of those will go into Japan.

Yet another contender for TV and PC image screens. Light-emitting polymer (LEP) is a thin, flexible plastic developed jointly by Seiko-Epson and UK firm Cambridge Display Technologies (CDT). Screens work by bombarding tiny dots embedded in polymer film with low voltage (5 volts) causing the dots to glow. Light up enough dots and bingo - you have a television image. There are advantages over LCD displays including

elimination of time lag which mars many LCD displays. Instant application is likely to be for portable PCs and camcorder viewfinder screens. Material is tough, does not mar easily, can actually be bent or folded without permanent degradation. First products due late this year - 12" PC screens.

Cable/Fibre/MMDS/Pay TV

Pace Microsystems reportedly closing down Australian office, ending direct support for Galaxy/Australis DGT400 receivers now in field for that pay TV service. Some key personnel in process of moving to positions with alternate DTH suppliers and/or other IRD suppliers. Pace was one of four "serious contenders" for the Optus Aurora programme initial order of 15,000 units. Pace UK advises they will cease production of Irdeto equipped IRDs shortly, concentrating on NDS encryption format products. Galaxy/Australis DGT400 is Irdeto design CA receiver. NBC Asia is another customer for the Irdeto equipped Pace receivers (in DVR500 form) which is now left without support by the change in direction at Pace.

Australia's pay TV race between Foxtel and Optus appears to be losing its balance in favour of Foxtel. A report in the Sydney Morning Herald relates Foxtel has passed 285,000 cable subscribers while Optus Vision currently claims 175,000 subscribers. DTH service provider Galaxy is reported to be losing ground, down to around 75,000 subscribers from a peak of 100,000 claimed in the last quarter of 1997. Regional pay TV provider Austar is actually number two in the market claiming just over 200,000 subscribers while Galaxy fed East Coast Television has fewer than 10,000 customers. The whole Australia market is believed to be near 670,000 pay TV homes out of a cable-passed universe approach 2.5 millions homes (26.8% penetration, which is several points "better" than New Zealand's Sky Network which has been operating nearly three times as long as the Australian systems).

U.S. cable TV rates are going up. Group owner TCI will increase rates 5.5% June 1st, last raised rates 7% in 1997. Cable industry is feeling effects of higher programming costs at all levels.

Terrestrial Broadcasting

New Zealand's Prime Television Network says it will launch television in five regional centres August 1st. Prime purchased the 32 UHF frequencies of former would-be Christian broadcaster UCB. Prime describes its operation as featuring "local news" plus network programming distributed from an Auckland master facility for Hamilton, Wellington, Christchurch and Dunedin. Programming, other than that created by the regional stations, will come from a heavy mix of British product plus the U.S. and Australia.

Former Christchurch UHF station CRY-TV (channel 56) is now operating through a programme source affiliation with religious broadcaster Trinity Broadcasting (Santa Ana, California). Canterbury Family Television Network, related to other Family Network stations throughout New Zealand, is now broadcasting on Christchurch UHF channel 46. Finally, local station CHTV on channel 52 is broadcasting continuous Bloomberg Financial Television feeds daytimes, and uses EWTN and CMT satellite feeds at other times during the week.

Ministry of Commerce plan to auction off spectrum space in the 1,700 to 2,300 MHz (1.7 to 2.3 GHz) region has drawn significant reaction from present users of this frequency range. The Ministry sees the frequency spectrum as a perfect home for PCS (personal communication service) operations and indeed segments of this spectrum have been set aside (and auctioned off) in other parts of the world for just that purpose. One of the largest present users of this frequency spectrum is BCL (the transmission arm of TVNZ). BCL expects there to be a significant impact on its present operations although present users will have a five year "softening off" period to re-equip for new frequencies and they will also be given an opportunity to purchase the frequencies they now use. The auction date has not been set but will occur in the middle of the year using an Internet bidding system first developed for the recent sale of 26/28 GHz frequencies in New Zealand.

Programming costs including sport right fees have increased so dramatically that half century system of U.S. network relations with their affiliates is in jeopardy. NBC has agreed to record US\$13 million per episode for award winning and top rated 'ER' programme starting in September. CBS is asking affiliates to defray portion of their annual costs with new five year NFL contract. Also in the sport area, Fox Network affiliates are estimated to provide U.S. \$30 million per year back to the network to help defray the high costs of securing Fox rights to American football. Affiliated stations typically are paid a share of network advertising sold on a national basis, and have commercial time around the programme to sell as well. With programming costs escalating, networks have first scaled back (and in some cases eliminated) sharing of revenues for commercial time within programmes, and are now asking that stations pay a share of the actual programme acquisition expense as well.

U.S. is studying plan to establish one FM band frequency, one AM band frequency for "Microradio" service. Concept would allow unlicensed AM and FM stations to operate with 1 watt of radiated power using 50 foot antenna height to provide local neighbourhood coverage. U.S. has been awash with privately built, so-called "pirate" radio stations in recent years, most of which defy FCC rules and certainly operate with more than 1 watt of power.

American TV audience measurement firm, Nielsen, reports they now have 260 distinct and separate over the air and cable TV "networks" either being measured or requesting measurement.

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